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While on Mt. Constitution, Orcas Island, Washington, about five o'clock in the evening one summer, Mark Said and I were watching the nighthawks in their tortuous flight. Unexpectedly one of the nighthawks made its dip, with the accompanying "woof," but a few feet from Mr. Said.

According to his description the bird threw its wings far to the front at the end of his downward glide, so that the uppermost quill feathers were pointed exactly in the direction of his glide. Going at such headlong speed, these quill feathers when thrown edgewise to the air vibrated strongly, causing the "woof."

FRANK A. HARTMAN

SEATTLE, WASH.

#### SCIENTIFIC BOOKS

*Vorlesungen über Landwirthschaftliche Bakteriologie.* By DR. F. LÖHNIS, Professor an der Universität Leipzig. Berlin, Verlag von Gebrüder Borntraeger, W. 35 Schöneberger Ufer 12a. 1913.

Agricultural bacteriology is gaining prominence in scientific and practical circles. The agriculturist realizes more and more that scientific investigations are of help to him and the demand on colleges for courses in agricultural topics is constantly increasing. However, text-books are still scarce. The series of lectures by Professor Löhnis is the outcome of a course of lectures in connection with a general course in agricultural bacteriology given by him in the University of Leipzig.

The ground is covered as thoroughly as modern knowledge permits. No one realizes more fully than the author how much work is needed to complete our really very meager knowledge in many agricultural branches. The reader must be impressed with the fact, frequently stated, that research is necessary and that authors do not agree in many instances.

The book is divided into two parts—a general part and a special part. The general part consists of fourteen lectures. The first lecture gives a general introduction to the significance and the problems of agricultural bacteriology and includes a historical review and a list of

some important books bearing on the subject. The shape, development and classification of microorganisms is covered in two lectures. The size of bacteria is admirably illustrated by diagrams showing the relation of the bacterial content of milk, butter and cheese to definite quantities of these substances. Such illustrations render the book exceptionally valuable, especially to students. Three lectures are devoted to conditions of existence and multiplication of microorganisms and two lectures to methods of cultivation and combating microorganisms.

Under the general head of "Products of Microorganisms" six lectures are united. The production of pigment, light and heat are discussed. The circulation of nitrogen, carbon, hydrogen and oxygen are given with considerable detail and illustrated in diagrammatic fashion. These complicated subjects are dealt with in masterly fashion, notwithstanding the fact that some facts are still poorly understood. Similarly, a lecture is given to the discussion of the decomposition and assimilation by bacteria of phosphorus compounds and the solution of carbonates and silicates. Mention is also made in this lecture of sulphur and iron bacteria. For the sake of completeness one lecture deals with pathogenic functions of microorganisms. It is hardly necessary to state that this extensive subject is treated briefly. However, the chief principles of virulence, infection, immunity, vaccination, serum therapy and chemo-therapy are ably dealt with.

The second "special" part commences with a lecture on the bacteriology of foods for cattle. Here the author forcefully shows the rôle played by microorganisms in the ripening and decomposing of foods. Many gaps in our knowledge are clearly pointed out.

Two interesting lectures give the student the most necessary knowledge of the milk question. The attitude of the author in regard to this important subject is of special interest. There are at present in this field the extreme views of those commercially interested and the no less extreme views of some sanitarians. Professor Löhnis takes an intermediate position, recognizing the necessity of

gradual, rather than forced, improvement in the milk supply, and sanitarians are warned against entertaining premature conclusions. Those sanitarians who have recklessly connected mastitis in cows with human diseases receive criticism from the author, although he does not neglect to emphasize that milk from cows with diseased udders should be rigorously excluded from human consumption, unless previously boiled. The author also points out that—as desirable as it is to establish grades of market milk—existing regulations are rarely reasonable and generally immature. Numbers of bacteria in milk are of relatively smaller significance than the possible presence of pathogenic bacteria. These may multiply in milk of small bacterial content more rapidly than in milk rich in bacterial life. Special emphasis is laid on the necessity of instructing producers. And here it must be stated that Professor Löhnis ranks among those old-world scientists who are ready to give full credit to American workers in agricultural fields.

One lecture is devoted to the bacteriology of butter and two lectures to cheese. There are five lectures on the bacteriology of manure and soil. These are also conservative and critical. Finally, the whole subject is reviewed in a retrospect and a prospect. Valuable suggestions for those interested in research work in agricultural lines are given.

As a whole the subject-matter is presented in good style, the numerous illustrations are exceptionally clear, and no one can read the book without adding materially to his knowledge and broadening his views.

P. G. HEINEMANN

*Franz von Kobells Lehrbuch der Mineralogie.*

Seventh edition. By K. OEBBEKE and E. WEINSCHENK. Leipzig, Friedrich Brandstetter. 1913. Pp. viii + 405; 1 plate; 344 figures in text. Price, 8.50 Marks.

In 1899 the sixth edition of this popular German text-book on mineralogy appeared under the same joint authorship as the present edition. In the new edition the text has been increased by 67 pages. The general portion has been entirely rewritten and the descriptive

part revised so as to bring the mineral data up to date.

There are three subdivisions in the general part, namely: (1) Crystallography, (2) Physical Mineralogy, and (3) Chemical Mineralogy; the special part is devoted to Descriptive Mineralogy.

Crystallography is discussed in 70 pages and under three headings, (a) general morphological properties of minerals, (b) special geometrical properties of crystals and (c) twins, development and intergrowths of minerals and inclusions. The discussion of crystallography is well adapted to the needs of the beginning student. The more important classes of crystals are considered at length upon the modern basis of symmetry, but reference is also made to the rather useful ideas from the standpoint of pedagogy of holohedrism, hemihedrism and so forth. The crystal drawings are exceptionally clear. Fig. 51 is, however, inverted.

Thirty-seven pages are devoted to physical mineralogy, which includes the following subdivisions, (a) specific gravity, (b) elasticity and cohesion, (c) optical properties and (d) miscellaneous physical properties. The discussions in this section are again limited to only that which is of importance to the student who has a general knowledge of mineralogy in mind. Thus, the polarization phenomena of crystals are disposed of in 14 pages.

The next 60 pages are devoted to chemical mineralogy. Here, (a) general chemical properties, (b) occurrence and formation, (c) weathering and decomposition, (d) synthesis and (e) classification and nomenclature of minerals are discussed. The chapter on the occurrence and formation of minerals contains a large amount of information not usually included in text-books on mineralogy of this character. Brief reference is first made to the classification, form, structure and paragenesis of mineral deposits. Then follow concise descriptions of the various types of the more important rocks and mineral deposits. This chapter is very well written, and similar discussions could be introduced to advantage in American texts on mineralogy.